



Promoting The Consumption Of Fish-Based Processed Products As A Strategy To Improve Children's Nutrition In Majakerta Village, Majalaya District, Bandung Regency

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Abstract

Efforts to increase fish consumption offer numerous benefits, not only enhancing intelligence but also boosting the fisheries industry. Currently, stunting remains a concerning issue, and data indicates that fish consumption is not evenly distributed across Indonesia. This represents one of the health problems that serves as an indicator of the health and well-being of a community. One of the themes of this community service program (or also known as PPM in Indonesia) is raising awareness about improving children's nutrition among the residents of Majakerta Village, Majalaya District, Bandung Regency. The implementation of the program is conducted in collaboration with student community service (or also known as KKN in Indonesia) activities. The primary objective of this program is to improve children's nutrition through the promotion of fish-based processed food consumption and to educate mothers in Majalaya District about recognizing stunting symptoms and addressing them. The main target of this program is children aged 6–12 years. The method used in this awareness campaign includes educational games about fish and fish-based processed food to make the material easier for elementary school children to understand. Additionally, one type of fish-based processed food is distributed for children to taste directly, aiming to increase their interest in fish consumption. The results achieved include improved knowledge about the importance of eating fish due to its many health benefits.

Keywords: Fish Consumption, Nutritional Improvement, Socialization, Stunting

1. Introduction

Stunting is one of the health problems that serves as an indicator of a community's health and well-being. According to data from the Health Department in 2021, the total percentage of stunted toddlers was 197.1, showing a decrease of -36.71%. The average percentage of stunted toddlers over the past eight years was 251.81. This prevalence was still categorized as high in that year, according to the Head of the West Java Health Department, Nina Susana Dewi. The West Java Health Department aimed to achieve zero new stunting cases, or zero stunting, by 2024. Bandung Regency was one of four regencies and cities with a very high stunting prevalence in 2021 (Amar et al., 2022).

The issue of stunting is closely related to the public's awareness of nutritional intake and the community's income level. Majalaya District is one of the districts in Bandung Regency with the lowest population density compared to other districts, so some areas still have potential for land utilization that can be used for the development of fisheries, which could increase the community's income (Firdaus et al., 2022). One form of utilizing fisheries that can be done is processing fish into food products.

Fish is one of the sources of protein that offers health benefits because it contains long-chain polyunsaturated fatty acids, namely omega-3 and omega-6, vitamins, as well as macro and micronutrients (Ramlawati and Anwar, 2018). As a food source, fish has a higher protein absorption capability compared to other animal products such as beef and chicken because the protein fibers in fish are shorter than those in beef or chicken. Additionally, fish also contains minerals such as calcium and phosphorus, which are necessary for bone formation, as well as iron, which is essential for the formation of blood hemoglobin (Inara, 2020).

Although fish offers many benefits to the body, data shows that fish consumption is not evenly distributed across Indonesia. The Ministry of Marine Affairs and Fisheries (also known as KKP in Indonesia) recorded the national fish consumption rate at 55.37 kg per capita in 2021. This figure grew by 1.48% compared to the previous year, which was 54.56 kg per capita. The government, through KKP, has set a target for fish consumption to reach 59.53 kg per capita per year in 2022. To achieve the National Fish Consumption Rate target, the Directorate General of Strengthening Competitiveness of Marine and Fishery Products continues to intensify the 'Gemarikan' campaign in 34 provinces,

focusing on regions with nutrition and stunting issues. KKP also targets a fish consumption rate of 62.5 kg per capita by 2024.

The low fish consumption rate among the Indonesian population is caused by several factors, one of which is the taste preference and the fishy odor that arises from fish meat. Additionally, the availability of fish in certain areas also plays a role, such as the uneven distribution of fish due to difficult-to-reach fish source locations. The limited variety of processed fish products is also one of the reasons (Effendi et al., 2019). Based on the issues identified, one way to address them is through socialization to the community about the importance of consuming fish-based processed foods as an alternative source of nutrition to prevent stunting.

This socialization is carried out in Majakerta Village, Majalaya District, Bandung Regency, with the main target being elementary school children. The socialization is conducted through persuasive communication, which aims to persuade, invite, or encourage the recipients of the message. The success of this socialization is measured by the results of questionnaires in the form of pre-tests and post-tests filled out by elementary school children regarding their interest in consuming fish-based processed foods before and after the socialization. It is hoped that this socialization will increase interest in fish consumption and prevent stunting by fulfilling the nutritional needs of elementary school children in Majakerta Village, Majalaya District, Bandung Regency.

2. Literature Review

2.1. Benefit of Fish

Fish are aquatic creatures classified under the class Pisces. They have gills, are cold-blooded, and have spines. Fish are one of the most important sources of nutrition for humans and are commonly used in daily food preparations. Fish are known for their nutritional value and as a source of protein, fats with omega-3, which help reduce the risk of cardiovascular disease (CVD), and minerals. The protein content in fish is comparable to that in meat or eggs. Additionally, fish is an affordable source of animal protein compared to other animal-based proteins such as beef and chicken (de Boer et al., 2020).

According to the Sarojnalini & Hei (2019), fish serve as an energy source needed by the human body to support daily activities. However, a deficiency in fish protein can also affect health and increase the risk of infectious diseases, heart disease, diabetes, and cancer. Some of these diseases are leading causes of death in Indonesia. According to the Ministry of Marine Affairs and Fisheries of Indonesia, consuming fish can have positive impacts on human health, including for heart health by preventing heart disease and stabilizing heart rhythm, helping with digestion, improving vitality, maintaining eye health, reducing symptoms of dry eye syndrome, preventing pneumonia, alleviating asthma and bronchitis, and preventing cancer.

2.2. Promoting The Consumption Of Fish-Based

The Fish Consumption Awareness Movement, commonly abbreviated as Gemarikan, is a systematic and structured effort initiated by the Ministry of Marine Affairs and Fisheries (KKP), involving all relevant components and elements of the nation to build individual and collective awareness about the importance of eating fish. This program was launched on April 4, 2014, by President Megawati Soekarno Putri. The goal of Gemarikan is to raise awareness about nutrition, encouraging people to consume fish, increase demand for fishery products, and ultimately contribute to higher national fish consumption and better nutritional intake from fish (Dwiyantri et al., 2023). In this program, the Ministry of Marine Affairs and Fisheries strengthens partnerships with organizations such as educational institutions, health services, MUI (Indonesian Ulema Council), APJI (Association of Indonesian Fish Processors), BKKBN (National Family Planning Coordination Board), and local government offices (such as the Fisheries and Marine Affairs Office of Yogyakarta).

The implementation of the Gemarikan campaign targets various groups, ranging from early childhood to adults. The Gemarikan program is carried out by instilling the mindset of fish farming and emphasizing the importance of fish for health and intelligence, while also building trust with parents as decision-makers to ensure that their children eat healthy fish that promote growth and intelligence (Ramadhan et al., 2022). Additionally, the program includes activities such as exhibitions, fish-based cooking competitions, safaris, promotional media, coordination meetings, health campaigns, culinary demonstrations, processing demos, and more (as stated by the Fisheries and Marine Affairs Office of Yogyakarta).

2.3. Nutritional Content and Benefits

Fish is a food ingredient that contains various nutrients. In addition to being more affordable, fish protein consumption is higher compared to other animal products such as beef and chicken, because fish meat has shorter protein fibers than beef or chicken. Fish types are also varied and have several advantages, including the presence of omega-3 and omega-6 fatty acids, as well as a complete composition of amino acids (Pandit, 2007). According to

Thilsted et al., (2014), fish is a highly nutritious food, containing about 18 grams of protein per 100 grams of fresh fish. In contrast, dried fish can contain up to 40 grams of protein per 100 grams. As supported by Pal et al., (2018), compared to other food sources, fish contains essential amino acids that are required by the human body, making the quality of fish protein comparable to that of meat.

Fish in general are foods rich in iodine (Nerhus et al., 2018). The body requires this substance to produce thyroid hormones (Ali & Majeed, 2022). The iodine content in fish is 83 micrograms per 100 grams, while meat only contains 5 micrograms per 100 grams. Therefore, high consumption of marine fish can help prevent iodine deficiency disorders (IDD). In addition to protein, fish is rich in minerals such as calcium and phosphorus, which are essential for bone formation, and iron, which is necessary for the formation of hemoglobin in the blood. Fish fat contains 70% unsaturated fatty acids, while meat is mostly composed of saturated fatty acids (Abbas et al., 2009). Fish is a protein-rich food needed by humans because it is not only easily digestible but also contains amino acids similar to those found in the human body (Suhartini and Hidayat, 2005).

The nutritional content of fish can also help lower blood cholesterol levels, improve children's intelligence and academic performance, reduce the risk of death from heart disease, alleviate rheumatic symptoms, decrease cancer cell growth, and contains omega-3 and omega-6 fatty acids (Pandit, 2007)

2.4. The Importance Of Increasing Fish Consumption

Indonesia has vast waters, both marine and freshwater, making the potential for fishery resources very high (Yonvitner et al., 2020). Efforts to increase fish consumption bring many benefits, not only improving intelligence but also boosting the fisheries industry. The extensive aquatic areas of Indonesia make its fishery potential abundant and highly advantageous. However, fish consumption in Indonesia is still relatively low compared to regions rich in plant-based protein sources. According to a report from the Ministry of Marine Affairs and Fisheries (KKP), the latest fish consumption rate (AKI) in 2019 was 54.50 kilograms per capita per year. The Ministry of Marine Affairs and Fisheries estimates that Indonesia's fish consumption will increase to 62.5 kilograms per capita by 2024. Therefore, it is necessary to increase fish consumption in society through accurate information to raise public awareness of the importance of consuming fish with its nutritional content.

2.5. Counseling

According to Purnama, (2014), counseling is defined as a form of activity aimed at educating individuals or groups, providing experience, knowledge, information, and various skills to shape the desired character, attitude, and behavior. The purpose of counseling is to increase knowledge about individuals, groups, and society so that healthy behaviors can be applied (Rudiansyah, 2021). According to Mubarak and Chayatin (2009), the purpose of counseling can be divided into three parts: the short-term goal is to create understanding and attitudes that lead to healthy behaviors, the medium-term goal is the implementation of healthy behaviors, and the long-term goal is to create changes towards optimal health conditions. The achievement of the goals of counseling can be influenced by the counseling process. This process consists of three main components: input, process, and output. Input refers to the subjects or objects, such as individuals, groups, or society. The process is the mechanism through which change occurs in the subjects, while the output is the result of the process, whether in the form of information or behavioral changes (Michie et al., 2020).

3. Materials and Methods

3.1 Materials

The Community Service KKN-PM Integrative activity was conducted in the form of socialization about the movement to promote eating processed fish as an effort to improve children's nutrition. The event was held at the Elementary Schools in Majakerta Village, Majalaya District, Bandung Regency, with the main target being fifth-grade students. Various materials were required during the socialization, including pre-post test papers, a laptop and projector for the presentation material, smartphones for documentation during the event, fun games with prizes for the winning students, and processed fish prepared by the group members. The socialization activities were held on January 17, 2024, at SD Majalaya 9 and SD Pasar Tengah, January 18, 2024, at SD Majalaya 2, and January 19, 2024, at SD Cikaro 1 and SD Cikaro 2, with a total of 161 students participating. Thanks to the assistance and support from the school and village authorities, the socialization program was successfully carried out.

The communication aids are tools used to convey health-related materials or messages. These tools are often referred to as teaching aids because they help demonstrate and prove something in the process of health education. Edgar Dale classified teaching aids into eleven types and illustrated each level of intensity with a cone. The cone shows that the base layer consists of real objects, with words positioned above it. This means that when receiving a message, real objects have the highest intensity for receiving the message and information.

Although conveying material through words alone is considered less effective or has the lowest intensity, good teaching aids help promote health by communicating health messages more clearly, making it easier for the target audience to understand and absorb the message. Visual aids play a crucial role in helping individuals understand complex health issues, enabling them to appreciate the value of health in human life. Generally, there are three types of teaching aids:

- a. Visual aids, which stimulate the sense of sight when receiving the message, such as slides, films, and images.
- b. Auditory aids, which stimulate the sense of hearing while delivering educational material, such as radios and compact discs (CDs).
- c. Audiovisual aids, which engage both sight and hearing during the counseling process, such as televisions, video cassettes, and digital versatile disks (DVDs).

3.2 Methods

The information obtained is expected to influence the behavior of the advised object. Socialization is necessary to achieve the best outcomes, and it should be delivered with methods that suit the number of items being discussed (Lee & Jacobs, 2024). There are several methods of counseling, including:

a. Individual method

In health promotion, the individual method is used to encourage new behaviors or develop someone who is interested in behavioral change or innovation.

b. Group counseling method

The target group size and the formal education level of the target audience should be considered in the group counseling method. For larger groups, the approach differs from that used for smaller groups.

c. Mass counseling method

The mass counseling method is used to convey information to the public, usually of a broad and general nature. This method involves reaching large numbers of people at once and is often used for widespread awareness campaigns.

In the implementation of this activity, there are several stages as follows:

1. Preparation Stage

The preparation stage begins with a discussion on the preparations for the socialization, followed by the development of content and materials for the socialization activity. Then, a survey is conducted at the five elementary schools located in Desa Majakerta. After the survey, the target for the socialization is determined, which is the 5th-grade students at each elementary school. Next, in the preparation stage, a proposal for the activity is drafted along with permission letters and invitations, and these documents are submitted. Once all permissions and target socializations are completed, the final preparations involve creating a PowerPoint presentation for the materials, preparing questions for the pre- and post-tests, and

2. Implementation Stage

The implementation of the activity took place over three days, on January 17th, 18th, 2024 from 09:00 to 10:35 AM, and on January 19th, 2024 from 09:00 to 10:50 AM, as the event was held at the GOR of Desa Majakerta. A pre-test was administered before delivering the material, which was presented using a PowerPoint slide, followed by a Q&A session on the material, fun games, and tasting fish-based dishes. The session was concluded with a post-test. Additionally, the posters that were created were displayed on the bulletin boards of each elementary school.

3. Follow-up Stage

The pre-test and post-test results filled out by the students showed a significant difference, indicating that by the end of the socialization event, the students had gained knowledge about fish, its benefits, and various fish-based dishes. It was also observed that the students' interest in consuming fish-based dishes in the future is expected to increase.

This socialization activity would be more effective if conducted in every class, ensuring that not only fifth-grade students benefit from the materials and advantages of the program. The subjects of this socialization activity were fifth-grade students from all elementary schools in the Desa Majakerta area, consisting of 48 students from SD Majalaya 2, 50 students from SD Majalaya 9, 37 students from SD Cikaro 1, 9 students from SD Cikaro 2, and 17 students from SD Pasar Tengah, totaling 161 students. The socialization activities for SD Majalaya 9 and SD Pasar Tengah were held in the 5th-grade classroom of SD Majalaya 9, while those for SD Cikaro 1 and SD Cikaro 2 took place at the GOR Desa Majakerta, and for SD Majalaya 2, the activities were conducted in the 5th-grade classroom of SD Majalaya 2. The schedule for the activities is outlined in the following Table 1

Table 1. Timeline of Activities for Elementary School Socialization Program

Time	Activity
07 January 2024	Development of Content for Elementary School Socialization Activities
09 January 2024	Conducting a Survey of Elementary School Locations in Majakerta Village
10 January 2024	Conducting a Survey of the Sports Hall in Majakerta Village
11 January 2024	Preparation of an Activity Proposal, along with Permission Letters and Invitations
12 January 2024	Submission of Permission Letters and Invitations
16 January 2024	Preparation for Socialization, Including Pre-Post Tests and Presentation Materials.
17 January 2024	Implementation of Socialization at Majalaya 9 Elementary School and Pasar Tengah Elementary School
18 January 2024	Implementation of Socialization at Majalaya 2 Elementary School
19 January 2024	Implementation of Socialization at Cikaro 1 Elementary School and Cikaro 2 Elementary School
24 January 2024	Process of Recapping Pre-Post Test Data
30 January 2024	Preparation of the Report

3. Results and Discussion

There are three stages of community service activities, namely: 1) pre-implementation stage, 2) implementation stage, and 3) follow-up stage.

1. Pre-Implementation Stage

In this stage, we carried out the planning for the socialization activities, which took place over approximately two weeks. The planning included:

- Developing the materials to be presented. As the target audience for these socialization activities consists of elementary school (SD) students in Majakerta Village, we made every effort to create materials that were not complex and easy to understand.
- Requesting the profile data of Majakerta Village from the village officials. This was done to determine the number of neighborhood units (RW) and elementary schools in Majakerta, ensuring that the activities would reach a broader audience.
- Conducting surveys at all elementary schools in Majakerta Village to select schools that were most likely to accept the planned activities.
- Preparing permission letters for the use of supporting facilities from the village office.
- Purchasing light snacks and prizes for supporting the activities.
- Detailing the planning, such as creating a schedule along with role assignments and selecting appropriate games.

After direct discussions and surveys at several schools, we, as the organizers, have decided that the Gemar Makan Olahan Ikan socialization activities will take place over three days. The schedule and locations are as follows:

1. Day One

Date : Tuesday, January 17, 2024
 Time : 09:00 - 10:30
 Subject/Audience : SDN Pasar Tengah and SDN Majalaya 09
 Location : Classroom 5, SDN Majalaya 09

2. Day Two

Date : Wednesday, January 18, 2024
 Time : 09:00 - 10:30
 Subject/Audience : SDN Majalaya 02
 Location : Classroom 5, SDN Majalaya 02

3. Day Three

Date	: Thursday, January 19, 2024
Time	: 09:00 - 10:30
Subject/Audience	: SDN Cikaro 1 and SDN Cikaro 2
Location	: Sports Hall, Majakerta Village

The selection of the schedule above is based on several factors, including the readiness for implementation, such as finalizing the materials to be presented, processing the rental of facilities to be used, ensuring the delivery and receipt of official invitation letters to the elementary schools involved, preparing fish sempol as a sample of processed fish to be distributed to the audience, and ensuring the availability of time for using the venues. Meanwhile, the selection of the subjects for the activity is based on the willingness of the schools and our capabilities as the organizers of the socialization. Additionally, the choice of elementary school students (SD) as the subjects of this activity is aimed at raising awareness about the importance of meeting nutritional needs by consuming fish, which serves as a vital source of nutrition and nutrients necessary for children's growth and development, supporting intelligence, immunity, and much more. It is also well-known that Bandung Regency has a very high stunting rate, so this activity is expected to contribute to the regional government's target of achieving zero percent stunting in West Java.

2) Implementation Stage of the Activity

The socialization activities were carried out over three days at three different locations, with five different subjects. The implementation began with a briefing for the committee and coordination with the school representatives to deliver opening remarks, prepare the classrooms, and organize all the necessary equipment for the activities. Once everything was ready, at precisely 09:00 AM, the Master of Ceremony (MC) opened the event.

The group coordinator delivered an opening speech, followed by a brief welcome from a school representative to the students, introducing who would be presenting and what topic would be covered during the session. Before the main material presentation titled "*Ayo, Makan Ikan!*" (Let's Eat Fish!), the MC asked the committee to distribute a pre-test questionnaire to assess the students' knowledge about fish and various fish products. This pre-test was in the form of a Likert scale with multiple-choice options. After the students completed the pre-test and the committee collected the forms, the main material presentation followed as the core of the event.

The presentation of the material titled "*Ayo, Makan Ikan!*" (Let's Eat Fish!) lasted for 20 minutes, including a Q&A session. The material was delivered in the form of an interactive PowerPoint presentation designed to be as engaging as possible. The main topics covered included the nutritional content of fish, the benefits of these nutrients, the types of fish that live in three different water types (saltwater, freshwater, and brackish water), and various fish processing methods. To increase enthusiasm and maintain focus during the presentation, the presenter occasionally asked light questions. Students who asked or answered questions were rewarded with prizes that had been prepared in advance.

After the material presentation and Q&A session, the next part of the event was a game led by the event division to boost the students' enthusiasm for the ongoing socialization activities. The games included a fish-themed puzzle and a connect-the-dots game. The puzzle game was conducted individually, while the connect-the-dots game was played in groups. Participants who did not win the games were given light snacks, and the winners received prizes.

As the event drew to a close, students were asked to return to their seats. Around 10:00 AM, the committee distributed *sempol* (fish skewers) to all students, explaining that these were an example of a processed fish product. The fish *sempol* had been prepared by the committee the day before. These *sempol* were made as appealing as possible to stimulate the students' appetites and foster a love for fish-based dishes. In addition to the *sempol*, the committee also handed out fun stickers with the phrase "*Ayo, Makan Ikan!*"

Before closing the event, the committee distributed post-test questionnaires to the students for completion. The questions on the post-test were identical to those on the pre-test. The purpose of distributing the post-test was to assess whether there had been any change in the students' knowledge about fish before and after the socialization activities. This was also to ensure that the students had understood the material presented. Once all the students had filled out the post-test and the committee had collected the forms, the event continued with the presentation of plaques to the schools as a token of appreciation and a memento. Before concluding the event, a group photo was taken, led by the PDD division. At 10:30 AM, the MC closed the socialization event for the day, expressing gratitude to the students and school representatives for providing the time and space to participate in this activity.

3) Follow-up Stage of the Activity

The follow-up actions from the conducted activities included the distribution and posting of posters containing the socialization material on the school bulletin boards. This was done with the hope that the posters would continue to be read by all students in the school, thus increasing their awareness of the importance of consuming fish. In addition, we also distributed pamphlets containing the recipe for *sempol* to the mothers who participated in the cooking demonstration we held in Majakerta Village. By distributing these pamphlets, we hoped to encourage the mothers to

start preparing fish-based dishes for their families as a means of ensuring proper nutrition.

Furthermore, the feedback from the children regarding the *sempol* during the socialization event was very positive. Most of the children really enjoyed the *sempol*, which could potentially motivate them to ask their mothers to prepare similar dishes for their meals.

The results from the pre-test and post-test questionnaires filled out by students from the five elementary schools in Majakerta Village show an increase in enthusiasm among the students for consuming fish after participating in the socialization activity and tasting the fish dishes we prepared. Below is the graph showing the data from the pre-test and post-test results:

The pre-test and post-test questionnaires were designed using a Likert scale from 1 to 4, ranging from strongly disagree to strongly agree. Out of 160 respondents, it was found that there was an increase of 17 respondents who selected the highest scale (4), meaning "strongly agree," after participating in the socialization activity.

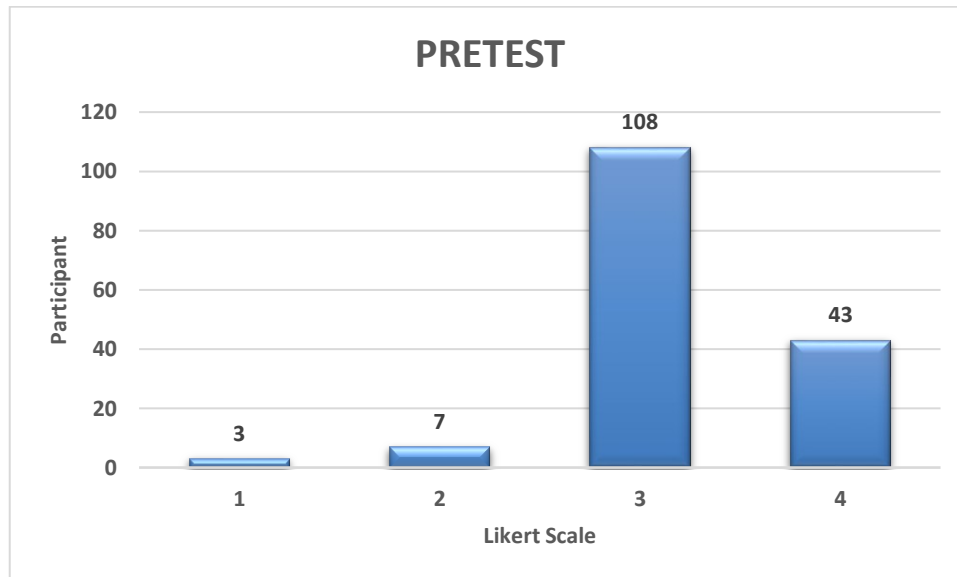


Figure 1. Graph of pre-test results for interest in eating processed fish

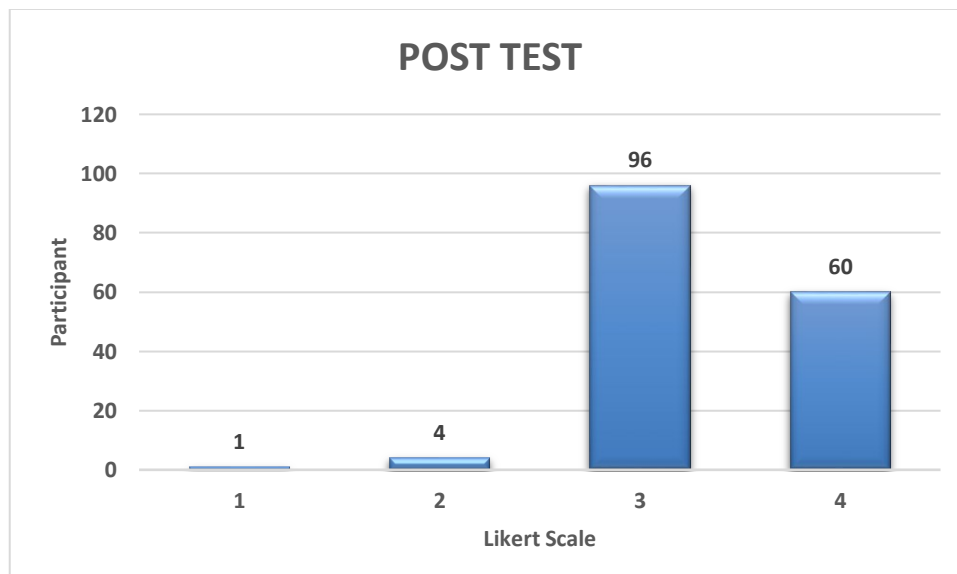


Figure 2. Graph of post-test results for interest in eating processed fish

The smooth execution of the socialization activities conducted recently had several outputs, including: 1) Increased knowledge among children about the nutritional content of fish that supports growth, 2) Increased interest in fish through preparations that matched their tastes, and 3) The results from the questionnaires showed an increased desire to consume fish-based snacks. The outcomes of the socialization activity itself include: 1) Increased fish consumption among children, 2) Fulfilled nutritional needs to support growth, and 3) A shift in the children's previously skeptical attitude toward fish dishes that were considered unappealing.

4. Conclusion

Stunting is a health issue that reflects the level of a community's health and well-being. Majalaya District in Bandung Regency has a low population density and potential for fisheries development, which can increase community income. However, the low fish consumption rate in Indonesia is influenced by taste preferences and the fishy odor of fish meat. Fish, rich in omega-3 and omega-6 fatty acids, vitamins, and other nutrients, can help address this issue. To promote fish consumption and prevent stunting, socialization about the nutritional benefits of fish-based processed foods was conducted. The initiative successfully increased children's knowledge about fish, improved their interest in fish dishes, and led to greater willingness to consume fish-based snacks. As a result, children's fish consumption increased, their nutritional needs were met to support growth, and their skepticism towards fish-based foods decreased.

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